

## NOTES: Lewis dot diagrams, Ionic and Covalent Bonding

### 1. Review

An atom that gains one or more electrons will have a \_\_\_\_\_ charge.

An atom that loses one or more electrons will have a \_\_\_\_\_ charge.

An atom that gains or loses one or more electrons is called an \_\_\_\_\_.

The outermost electron shell is also known as the \_\_\_\_\_.

### 2. Lewis Dot Diagrams

1.

2.

3.

EX: Na      Cl

### 3. What is an ionic bond?

Atoms will transfer one or more \_\_\_\_\_ to another to form the bond.

Each atom is left with a \_\_\_\_\_ outer shell.

A positive ion is called a \_\_\_\_\_ and a negative ion is called an \_\_\_\_\_.

An ionic bond forms between a \_\_\_\_\_ ion with a positive charge and a \_\_\_\_\_ ion with a negative charge.

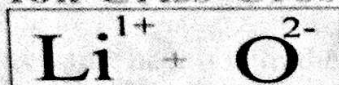
### Ionic bond practice using Lewis dot diagrams

**Example 1: Potassium + Bromine**

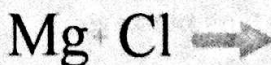
**Example 2: Lithium + Oxygen**

#### 4. Writing a formula using the criss-cross method for ionic bonds:

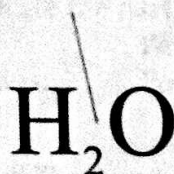
##### Ion Criss-Cross



##### Ion Criss-Cross Practice



4a. \_\_\_\_\_ show the number of atoms present of a certain element in molecule or compound



# of H =  
# of O =



# of Li

# of OH

4b. A

Polyatomic ion is:

To write the formulas if there is more than one of these groups one must use

Ex: Al and  $\text{NO}_3$

They can be found on the back of your periodic table, when naming them use the names found there... or here!!

+2	-1	-2
$\text{Hg}_2^{2+}$ mercury (I) or mercurous	$\text{C}_2\text{H}_3\text{O}_2^-$ acetate	$\text{CO}_3^{2-}$ carbonate
	$\text{ClO}_3^-$ chlorate	$\text{CrO}_4^{2-}$ chromate
	$\text{ClO}_2^-$ chlorite	$\text{Cr}_2\text{O}_7^{2-}$ dichromate
	$\text{CN}^-$ cyanide	$\text{HPO}_4^{2-}$ hydrogen phosphate
	$\text{H}_2\text{PO}_4^-$ dihydrogen phosphate	$\text{O}_2^{2-}$ peroxide
	$\text{HCO}_3^-$ hydrogen carbonate (bicarbonate)	$\text{SO}_4^{2-}$ sulfate
+1	$\text{HSO}_4^-$ hydrogen sulfate (bisulfate)	$\text{SO}_3^{2-}$ sulfite
$\text{NH}_4^+$ ammonium	$\text{OH}^-$ hydroxide	$\text{S}_2\text{O}_3^{2-}$ thiosulfate
$\text{H}_3\text{O}^+$ hydronium	$\text{ClO}^-$ hypochlorite	
	$\text{NO}_3^-$ nitrate	
	$\text{NO}_2^-$ nitrite	
	$\text{ClO}_4^-$ perchlorate	-3
	$\text{MnO}_4^-$ permanganate	$\text{PO}_4^{3-}$ phosphate



## 5. Naming compounds

When two atoms of a different element come together we call that a COMPOUND..... each compound has a specific name.....

The name begins with the name of the \_\_\_\_\_ followed by the name of the \_\_\_\_\_. The \_\_\_\_\_ does not keep its full name, the ending is chopped off and replaced by "-ide"

Examples:

1. Ca and I \_\_\_\_\_

2. Mg and O \_\_\_\_\_

3. Na and S \_\_\_\_\_

**5a.** Many transition metals have more than one \_\_\_\_\_.  
Indicate the particular oxidation by using \_\_\_\_\_.

Ex.  $\text{Fe}_2\text{O}_3$  \_\_\_\_\_  
versus:  $\text{FeO}$  \_\_\_\_\_

## 5b. Polyatomic ions and naming:

NAMES SHOULD END IN -ATE OR -ITE AND INFREQUENTLY IT WILL REMAIN -IDE (CYANIDE AND HYDROXIDE)

Examples:

$\text{Ca}(\text{OH})_2$  \_\_\_\_\_

$\text{CuSO}_4$  \_\_\_\_\_

$\text{NH}_4\text{NO}_3$  \_\_\_\_\_

$\text{Co}_2(\text{CO}_3)_3$  \_\_\_\_\_

## 6. What is a covalent bond

Atoms \_\_\_\_\_ one or more electrons with each other to form the bond.

Each atom is left with a \_\_\_\_\_ outer shell.

A covalent bond forms between two \_\_\_\_ - \_\_\_\_.



Name \_\_\_\_\_  
Physical Science

## Use Lewis dot diagrams to draw the following covalent bonds:

Example1: Chlorine + Chlorine

Example2: Oxygen + Oxygen

Example3: Carbon + 2 Oxygen

Example4: Carbon + 4 Hydrogen

In a single bond \_\_\_\_ pair of electrons is shared

In a double bond \_\_\_\_ pair of electrons are shared

## 7. Characteristics of Bonds:

Characteristics of:	
Ionic compounds	Covalent compounds
1. Hard	1. Solid, Liquid or gas
2.	2.
3. High melting point	3. Flammable
4.	4.
5. Only conduct electricity when melted	5. Do not dissolve in water
6.	